

An Epitome of Chatbot: A Review Paper

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Abstract: Chatbot is a technology which is used to do the interactions between the human and the machine, these chatbots can be used in various fields and have various purpose to do the task, where a human can lag behind due to various reasons. Some of the most recent and advance chatbots are in a voice like IBM Watson, Amazon Alexa, Google Assistance, Microsoft's Cortana, Apple Siri, wherein text question and answering we have Google Allo, Mitsuku and many more examples lay down. These all chatbots makes life easier to answer the question for different application in no mean of time. As they were being made with different tools and technology like Natural Language Processing (NLP). The technology of machine learning is growing so rapidly that the implementation of chatbots in the organization, and doing the research can improve the efficiency of it and can perform outstandingly in a different sector. The most demanding sector of chatbot is in the business sector where the customer service plays an important role, as they can do the continuous work, and handles the client by 24/7 support. Chatbot virtual assistance gives genuine feedback support to client, where artificial intelligence and machine learning do the backend work done in processing and giving appropriate answer or output to the user.

Keywords: Chatbot, Machine Learning, A.I, NLP, Neural Network, Deep Learning.

I. INTRODUCTION

Getting information from the internet, having a conversation to the customer care, about the products with the seamless instant reply, this is what we call a chatbot can do all this task, working 24/7 dealing with various languages from the different time zone of the world. Now a day, we do have got involved in chatting rather than voice conversation, calling and video call, consumers are going towards advertisement and generating leads from the chatbots that always ready to help and get the things done in few seconds. Social media is the best platform to see the potential of a chatbot.

A chatbot is a conversation between the human and machine, where the human sends query and machine reads the sentence and tokenize the sentence and make a decision with the help of various techniques and methods. It is very similar to chatting, where on one end the user or client ask the queries and from another end the machine gives replies, having various suggestions too for the user to respond back, it is very much convenient and has no wait time to process and bring back the results. This is only possible with various technology and methodologies that we are going to discuss this paper.

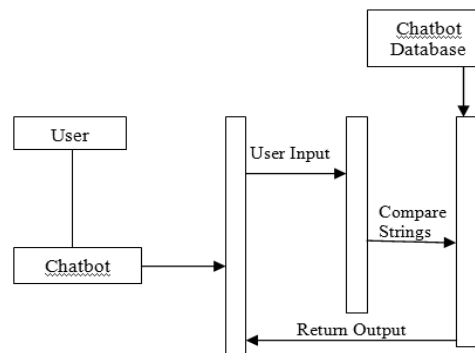


Fig: Sequence Diagram Representing Design of the Chatbot [1]

II. TYPES OF CHATBOT

Basically, the chatbots are of two types a. Fixed Based and b. AI-Based

A. Fixed based

This is a type of chatbot which gives fixed options in the query and does the fixed operations and is in limited helpful to the customers or users. Example while calling the customer care of telecommunication, they ask to press the 1-9 digits to perform a task like balance inquiry, porting

service, active services, to deactivate service etc. These types of chatbots are not so popular due to inability to interact and understand to the users. They always face challenges and they are boring while interaction.

B. Artificial Intelligence -Based

Artificial Intelligence (A.I) based chatbots are advanced and dynamic learning in nature, they are intelligent, having the great user interface to interact with the users with superior design, where they can reply to users query in a very interactive way and they learn from the past reply histories to make the experience better, while slowly and steadily the accuracy of the results increases based on the number of interaction. [2]

III. TECHNOLOGIES USED TO CHATBOT:

A chatbot is a technology which is used to function through Machine Learning based on the Artificial Neural Network (ANN) which gives a simulation of neurons present in our brain which is used for processing the data. They are used to programmed the chatbot to have better-polished replies to the queries with new dialogs and words for a better response. One of the tech giants Facebook made MessengerBot for the organizations and the companies which they want to interact with their customers. This messengerbot can do a whole lot of things from getting the information from the internet to booking the flight, checking the reservation's status, scheduling the appointments for doctors, lawyers, salon and many more things like finding the groceries item and ordering the items from the company's messengerbot.[3]

The technology which we are going to illustrate in this paper is Deep Learning, which is the subset of Machine learning in Artificial Intelligence(AI), where stimulate the function of the human brain, the way neurons play a major role in processing the data and creating the patterns for making the decision and capable of self-learning.

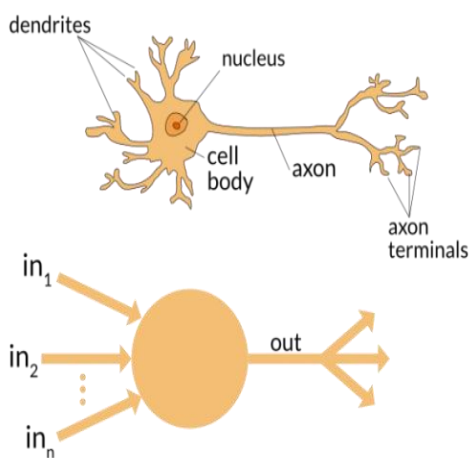


Fig: Neurons (Human Brain) [4]

Deep Learning is also known as Deep Neural Network that can handle the Big Data from all around the world in the form of unstructured form that comes from different platform like e-commerce, social media, internet search engine, which are unstructured and unreadable by human being, and if they tried to process the single data they will take years to analyze according to the Computer World magazine states that unstructured information might account for more than 70%–80% of all data in organizations[5], which human cannot analyse this much of data for their lifetime, so with the help of machine learning and deep learning technique we can help analyse the big data in very fast and in a systematic way.

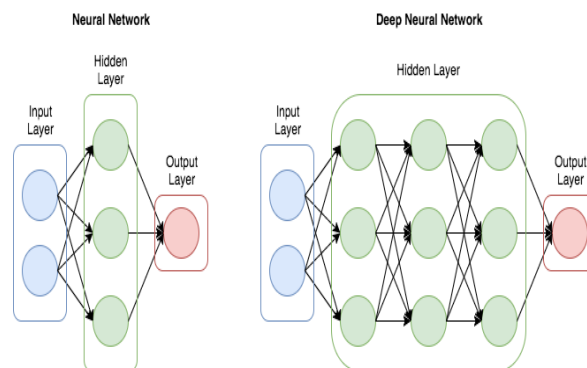


Fig Neural Network and Deep Neural Network [6]

In the Artificial Neurons Network we take the input data, we have weights, we process the data through numbers of layers we call as hidden layer, where the first layer passes the raw data to the second layer and then the second layer process the data and passes to next layer and process goes on to the activation function and then after activation function the output is given, then this estimated output is compared with the actual output and it is not matched or it has errors then it is backpropagation process takes place also known as training the data sets by updating the weights connected to nodes, where cost function is used to update the weights, this process goes on till the estimated output is equal to desired output. [7] This technology plays important role in the various sectors and solves various issues like Bank Fraud, Credit Risk Modelling and many more. [8]

IV. APPLICATION OF CHATBOT

Chatbots are being used in various sectors including small organizations to multi-billion organizations to handle the request from the users or customers and give the best support at any time in any part of the world.

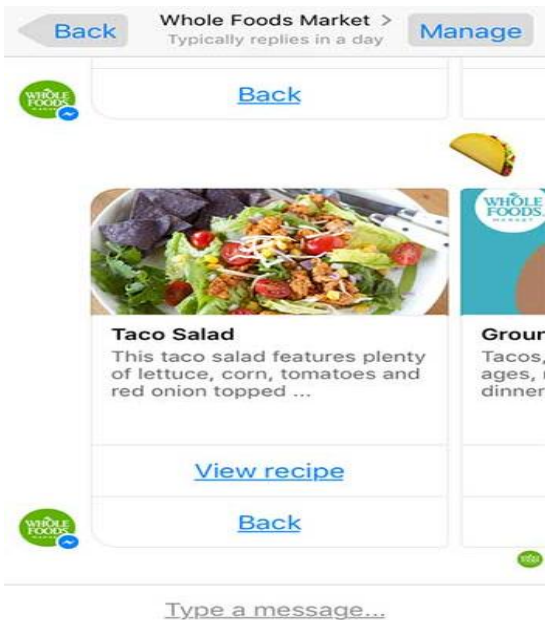


Fig: - ChatBot [9]

There are lots of bots specially build for the specific purpose and they are like

RetailBot

They are used to show the products item to the customers and customers pick the items or note the list of products and order the company for the consumer request for groceries or food delivery.

WeatherBot

They provide the weather report to the user on the demands like temperature, cloudy or sunny, humidity, rainfall.

FriendlyBot

These are the bots which are used to interact to users as being a friend, talking about their life, likes and dislike, general conversation, where a user feel good while talking to the chatbot, these bots analyze the sentiments of the users and it interacts in their sentiments perspective.

V. PROS OF CHATBOT

Reduced Cost

As installing the technology in the system, it won't require the manpower to operate the system as it is autonomous in behavior. It saves cost on answering same old general questions, where a company has to pay their employee for the same question like example "how to apply for a loan", "what documents are required to open account" and so on.

24/7 Availability

The system is every time up for the support, where it accepts any query, at any time from any part of the world, whether it is midnight, weekend or holidays, it can handle any query at any time, which makes the customer no wait for executives to come and solve their problem in office hours.

Learning and Updating

Artificial Intelligence (AI) helps the system to learn the datasets and keep updated for the queries also the system is being trained effortlessly at every interval of time, where a company has to train their employees for a certain task, where company has to invest in time and money, as chatbot does its job seamlessly.

Multiple Customer Handling

What happens when there is a lot of traffic of customer and only limited employee can handle the limited customers at a time, where customers have to wait in the queue and even worse they leave unanswered. But in the case of chatbots they can handle as many clients as they can, they can handle limitless clients queries at the same time, no clients queries are unanswered.

VI. CONS OF CHATBOT

Interface

To design the chatbot, it is very complicated and requires a lot of knowledge of various technology and coding experience, the structure is very complicated, making the datasets, training it and when predicting the results, if something goes wrong, it may annoy the users as it takes time to understand the query and to be trained the dataset for the perfect predicted responses of the queries.

Memory

The major drawback is that it cannot store the previous conversation of the same customer having same issues, where it can be frustrating for a customer to retype again and again the same queries at every time it visited back.

Setup

For setting up the chatbot environment in the system it may take a long time to analyze the dataset and to train it. The system setup is way more expensive where it also takes time for updating and learning the new words for responses, this is a very risky investment as what if it cannot handle the client's query, because chatbots responses are for company reputation, if something goes wrong, company has to face challenges.

Zero decision making

It cannot decide whether the product is liked by the customer or not, it just shows the product, it does not care about the customer feelings, it cannot manipulate the user and cannot handle the situation.

Employment

Chatbot can cause the elimination of lower end employee in the company as they can do their same job very fast and effectively.

VII. FUTURE WORK

ChatBot is an Artificial Intelligence (AI) technology where Machine Learning plays an important role to make advance chatbot making precise responses according to the experience of their interaction and also improving their accuracy and with that chatbot become more effective in their sectors, as we now know that chatbot can play major role in various sectors like education, business, medical, online chatting and many more. They can help the children to answers their queries regarding educational information, it also can help in suggestions like market share, which apparel suits you, or shortest path guidance. [10] It can also suggest the disease you are having according to the symptoms feed to a system and also suggest the medicine or treatment procedure. As seen the chatbot is unstoppable and growing so rapidly, and so the conversation would become smart and interaction will be precise and fetching information become so easy, this will become a day to day life's need.

VIII. CONCLUSION

A chatbot is a system which mimics the human style conversational Robot, where we can feel free to talk about anything. In this paper we have discussed what are chatbots, types of chatbots, what technologies they are based on, how they can be helpful to our life and make easier, advantages and disadvantages of it, most powerful chatbots present till date, taking all this as a brief overview of the chatbot. In the market there are many ways and lots of methods to create and analyze the queries, many companies making their own chatbot for their own need and they also have to take note of using chatbot should be simple and have to be user-friendly. [11]

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